

WHAT IS CLAIMED IS:

1. A method for selectively separating live
cells which have expressed mRNA comprising:

5 a first step of introducing a marker capable of
labeling mRNA into cells in a live cell group
containing live cells which have expressed a specific
mRNA;

10 a second step of labeling said mRNA with said
marker to obtain a live cell group containing live
cells having the labeled mRNA; and

15 a third step of detecting said labeled mRNA to
identify the live cells having said labeled mRNA and
separating the identified live cells selectively from
said live cell group obtained in said second step.

20 2. The method according to claim 1, wherein
said marker in said first step is a probe which has a
base sequence complementary to said mRNA and has been
labeled with a fluorescent dye, said labeled mRNA in
said second step is a hybrid of the probe and said
mRNA, and the selective separation in said third step
is performed by irradiating light to the live cell
group containing live cells having the hybrid,
identifying live cells which cause a change in
fluorescence of said fluorescent dye based on
formation of the hybrid, and separating the identified
25 live cells from the live cell group.

3. The method according to claim 2, wherein
said probe comprises a first probe and a second probe,
the first probe and the second probe have base
sequences capable of hybridizing to said mRNA
5 adjacently, the first probe is labeled with an energy
donor fluorescent dye and the second probe is labeled
with an energy acceptor fluorescent dye, and said
change in fluorescence is caused by fluorescence
resonance energy transfer (FRET) from the energy donor
fluorescent dye of the first probe to the energy
acceptor fluorescent dye of the second probe.

4. The method according to claim 2, wherein
the selective separation in said third step of said
live cells based on the change in fluorescence is
performed by a cell sorter (FACS).

5. The method according to claim 1, wherein
said mRNA is an mRNA encoding a cytokine.

6. The method according to claim 3, wherein
said mRNA is an mRNA encoding interleukin-2 (IL-2),
said first probe is a probe having a base sequence set
forth in SEQ ID NO: 9 in the Sequence Listing, and
said second probe is a probe having a base sequence
set forth in SEQ ID NO: 10 in the Sequence Listing.
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7. The method according to claim 1, wherein
25 the live cells selectively separated in said third
step are T Helper 1 (TH1) cells.

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8. The method according to claim 3, wherein said mRNA is an mRNA encoding interleukin-4 (IL-4), said first probe is a probe having a base sequence set forth in SEQ ID NO: 17 in the Sequence Listing, and said second probe is a probe having a base sequence set forth in SEQ ID NO: 18 in the Sequence Listing.

9. The method according to claim 1, wherein the live cells selectively separated in said third step are T Helper 2 (TH2) cells.